

Hydro observation

Wireless transmitters monitor river water temperatures for Lenzing in Austria

EMERSON PROCESS Management has successfully applied its Smart Wireless solution to monitor river water temperatures at the Lenzing Fibers mill in Heiligenkreuz, Austria.

Installation of the wireless temperature transmitters provides a cost effective and highly reliable solution for the company to meet government environmental regulations in respect of the temperature of water discharged into rivers and watercourses.

Lenzing Fibers is part of the Lenzing Group, the world's largest producer of cellulose fibre, using beech wood from managed sustainable forests as its raw material.

Over 60,000 tonnes are produced annually by Lenzing Fibers, primarily for the textile industry. Typical end products are clothing and home textiles. Lenzing Fibers also produces other special fibres for hygiene and technical applications.

Highly evolved

The company believes that adopting innovative technologies and putting major investment into environmental protection has made it a quality, technology and environmental leader for man-made cellulose fibres. As well as its raw material coming from a sustainable source, the company's environmental protection policies and equipment are highly evolved. High environmental standards enable the company to have a minimal impact on the area surrounding its sites as well as enabling it to stay ahead of local, national and European environmental regulations.

At its Heiligenkreuz mill and integrated fibre plant near the Hungarian border, Lenzing Fibers uses water drawn from the River Lafnitz for cooling purposes within the plant. Following its use within the facility, the water is returned to the river. Although the returned water is completely clean, during the process the

temperature is raised slightly. Local environmental regulations require that any water returned to the river must not be more than three degrees Celsius higher in temperature than the water extracted. In addition, the company must maintain a constant check and record of the water temperature at both inlet and outlet points.

Expensive

The nearest control room is situated about 200 metres from the river and this presented a problem in terms of connecting the remote temperature sensors back to the control system. The company was faced with an expensive measurement solution if it was to use wired temperature transmitters. Cabling would need to be installed over large distances and across open ground where providing cable containment and protection would be expensive.

"Because of the distance of the river from the control room and the fact that the general public are free to walk by the river, we would have had to dig a trench for the cabling and this would have been very expensive," explained Wolfgang Gotzi, head of the company's automation department. "The cost of installing wireless is much lower and has made this project possible."

Prior to the regulation being introduced, Lenzing was already monitoring the water temperatures manually, involving daily visits to the river.

However, to meet the environmental regulation there was a need to improve the reliability of the results and for these measurements to be easily stored and made readily available for inspection. By implementing a solution that enabled online measurements, Lenzing Fibers had an opportunity to reduce operations costs by eliminating the number of trips to the river and to streamline the reporting.



The Lenzing Fibers mill in Heiligenkreuz, Austria.



Lenzing produces over 60,000 tonnes of fibre each year.

A live demonstration of the Emerson Smart Wireless self-organising network convinced the company that the technology would be suitable for its application and it subsequently purchased five Emerson Smart Wireless transmitters and a wireless gateway for its temperature measurement task.

Clear path

Emerson's Smart Wireless solution is based on transmitters that can act as a router for other nearby devices, passing messages along until they reach their destination. If there is an obstruction, transmissions are simply re-routed along the network until a clear path to the Smart Wireless gateway is found. As conditions change or new obstacles are encountered in a plant, such as temporary scaffolding, new equipment, or a parked lorry, these wireless networks simply reorganise and find a way to get their signals through.

Automatic

All of this happens automatically, without any involvement by the user, providing redundant communication paths and better reliability than direct, line-of-sight communications between individual devices and a receiver.

This self-organising technology optimises data reliability while minimising power consumption.

It also reduces the effort and infrastructure necessary to set up a successful wireless network.

The temperature of the river water at the extraction point is measured using a Rosemount temperature sensor. This is connected to Emerson's Rosemount Wireless 648 transmitter positioned well above the water line to protect it from unusually high water levels.

A similar setup exists 200 metres downstream at the outlet point where water is returned to the river. A third transmitter, a further 200 metres after the return point, provides the water temperature after remixing. A fourth transmitter is currently used as a weather station and is situated by a nearby lake that is used as a cooling water reserve. This device acts as a repeater and provides additional paths for the self-organising network, ensuring the highest possible communication reliability.

Easy

"The Emerson technology was both easy to install and integrate and has been extremely reliable in terms of data transfer," said Mr Gotzi. "When all the transmitters were in place the network offered us a communications reliability of 100%, which is very impressive. We are currently looking at other applications where Smart Wireless can be applied."

The Smart Wireless network is integrated into the existing control system at Lenzing Fibers via the wireless gateway. The gateway is attached to an external wall of the pump station control room which is located near the inlet measurement point. The other two transmitters are situated between 200 and 400 metres from the gateway. The standard range of the transmitters is about 200 metres, but the Smart Wireless self-organising network extends the range. The gateway is connected to the existing control network via an RS-485 serial connection and then the temperature information from all the transmitters is fed back into a data historian.

Diagnostics

Lenzing Fibers is currently using an Emerson RS3 control system within the main plant as well as Emerson's AMS Suite of software applications. AMS Suite: Intelligent Device Manager is used to manage the new Smart Wireless devices, enabling the technicians to configure the devices, run diagnostic



The temperature of the river water is measured using a temperature sensor connected to Emerson's Rosemount Wireless 648 transmitter.

checks and monitor alarms and alerts. AMS Suite is also used to manage and store calibration information.

"The wireless transmitters have removed the need for visits to the river to take manual temperature readings," said Mr Gotzi. "By moving to an online measurement and recording system it is enabling staff to turn their attention to other maintenance and operating tasks."

Smart Wireless has provided Lenzing with a cost effective measurement solution requiring no signal cabling and fast site deployment. Immediate measurement and trending of the water temperature can be made and results stored to comply with the environmental regulations. Furthermore, the technology offered both ease of installation and the reliability of connection required.

Emerson, based in St Louis, Missouri, USA, is a global leader in bringing technology and engineering together to create solutions through its network power, process management, industrial automation, climate technologies and appliance and tools businesses. Sales in fiscal 2008 were \$24.8 billion. **TMI**